Supporting Information for

Single Particle ICP-MS and GC-MS Provide New Insight into the Forming Mechanisms for AgNPs Green Synthesis

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Table S1. Relative abundance of metabolites before and after reaction during formation of AgNPs. (The relative abundance values were reported as the "average ± standard deviation" of three replicates.)

Metabolites	Classification	Relative Abundance		Fold
		Before	After	
Alanine	Amino acid	7.89±0.49	7.21±0.03	1.1
Beta-Mannosylglycerate	Ester	485.13±25.25	444.95±38.14	1.1
N-Acetylisatin	Amino acid	0.96±0.05	0.88±0.15	1.1
N-Methyl-L-Glutamic Acid		13.02±0.28	12±1	1.1
Ethanolamine		253.05±10.65	234.51±9.32	1.1
Fucose	Sugar	24.85±0.79	23.2±1.95	1.1
D-Arabitol	Sugar alcohol	10.23±0.01	9.66±0.24	1.1
Aminooxyacetic Acid	Organic acid	2.96±0.05	2.81±0.07	1.1
Sorbitol	Sugar alcohol	5.15±0.01	4.89±0.12	1.1
Valine	Amino acid	189.21±1.34	180.72±3.28	1.0
D-Talose	Sugar	127.73±5.17	122.64±18.29	1.0
Galactinol		266.67±8.32	259.61±0.01	1.0
Glycine	Amino acid	305.63±1.75	299.35±0.65	1.0
Glucosaminic Acid	Organic acid	2.39±0.04	2.35±0.05	1.0
Glycerol	Alcohol	264.3±1.2	262.4±2.88	1.0
Norvaline	Amino acid	0.39±0.05	0.39±0.01	1.0
3-Hydroxypyridine		1.68±0.18	1.67±0.01	1.0
Diglycerol	Alcohol	5.37±0.05	5.35±0.15	1.0
1,5-Anhydroglucitol	Sugar alcohol	0.24±0.02	0.24±0.01	1.0
22-Ketocholesterol		1.76±0.41	1.76±0.04	1.0
O-Succinylhomoserine		0.23±0	0.23±0	1.0
2-Furoic Acid	Organic acid	1.84±0.24	1.84±0.08	1.0
Gluconic Lactone	Ester	7.45±0.15	7.65±0.01	1.0
Citramalic Acid	Organic acid	26.36±0.13	27.23±0.58	1.0
Ribonic Acid, Gamma-Lactone		0.74±0.02	0.78±0.02	1.0
Mannitol	Sugar alcohol	11.34±0	11.88±0.39	1.0
Tyrosine	Amino acid	32.89±0.09	34.58±1.9	1.0
Citric Acid	Organic acid	401.56±12.5	423.38±2.28	0.9
D-Erythro-Sphingosine		15.61±0.45	16.65±0.25	0.9
Nicotinic Acid	Organic acid	15.49±2.03	16.56±0.07	0.9
3-Hydroxybutyric Acid	Organic acid	0.17±0.01	0.18±0.01	0.9
2-Methylglutaric Acid	Organic acid	0.96±0.02	1.05±0	0.9
Leucrose	Sugar	0.16±0.01	0.17±0.01	0.9
O-Acetylserine		4.15±0.18	4.56±0.23	0.9

Table S2. Trials to screen optimal reaction pH, temperature, time for synthesis of AgNP.

Number	pH	Temperature/°C	Time/h
1	4.02	25	0.5
2	4.02	25	1
3	4.02	25	2
4	4.02	25	4
5	4.02	50	0.5
6	4.02	50	1
7	4.02	50	2
8	4.02	50	4
9	4.02	80	0.5
10	4.02	80	1
11	4.02	80	2
12	4.02	80	4
13	5.86	25	0.5
14	5.86	25	1
15	5.86	25	2
16	5.86	25	4
17	5.86	50	0.5
18	5.86	50	1
19	5.86	50	2
20	5.86	50	4
21	5.86	80	0.5
22	5.86	80	1
23	5.86	80	2
24	5.86	80	4
25	10.01	25	0.5
26	10.01	25	1
27	10.01	25	2
28	10.01	25	4
29	10.01	50	0.5
30	10.01	50	1
31	10.01	50	2
32	10.01	50	4
33	10.01	80	0.5
34	10.01	80	1
35	10.01	80	2
36	10.01	80	4

Table S3. Trials to screen optimal ratio of $AgNO_3$ and leaf extract for green synthesis of AgNP.

Number	pH	Temperature/°C	Time/h	Ag/leaf extracts
1	10.02	80	0.5	1:4
2	10.02	80	1	1:4
3	10.02	80	2	1:4
4	10.02	80	4	1:4
5	10.02	80	0.5	1:1
6	10.02	80	1	1:1
7	10.02	80	2	1:1
8	10.02	80	4	1:1
9	10.02	80	0.5	2:1
10	10.02	80	1	2:1
11	10.02	80	2	2:1
12	10.02	80	4	2:1
13	10.02	80	0.5	4:1
14	10.02	80	1	4:1
15	10.02	80	2	4:1
16	10.02	80	4	4:1

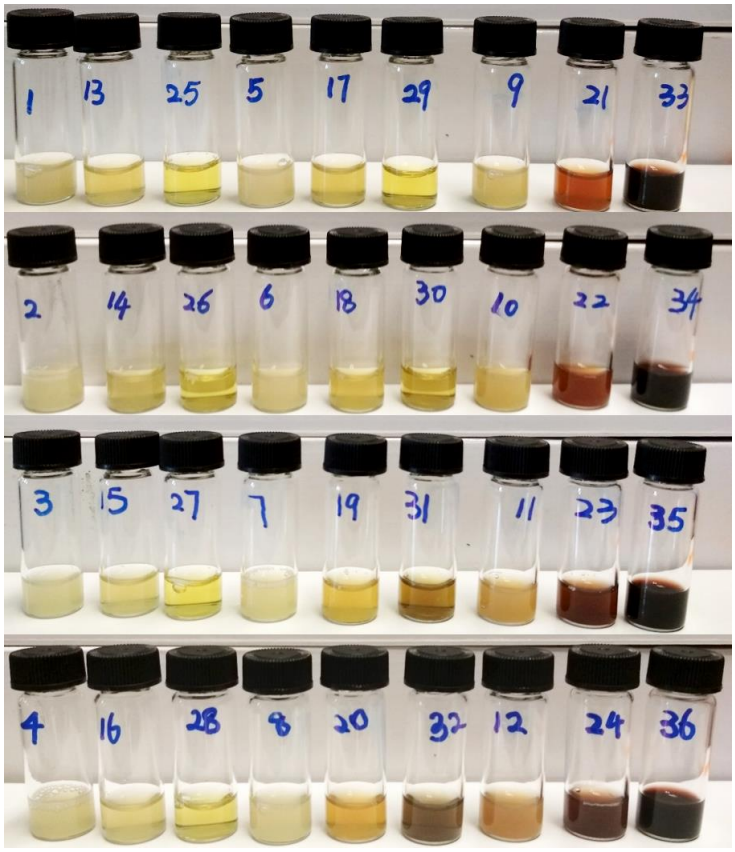

Figure S1. The color change of the Ag^{+} solution for optimal green synthesis screening. Trials number with detailed reaction pH, temperature, time were listed in Table S2.

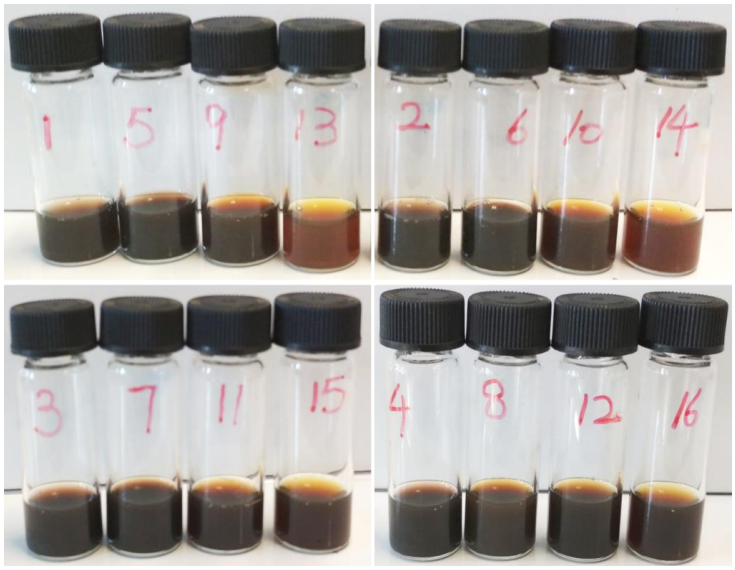

Figure S2. The color change of the Ag^{+} solution for optimal green synthesis screening. Trials number with the detailed ratio of $AgNO_3$ to leaf were listed in Table S3.

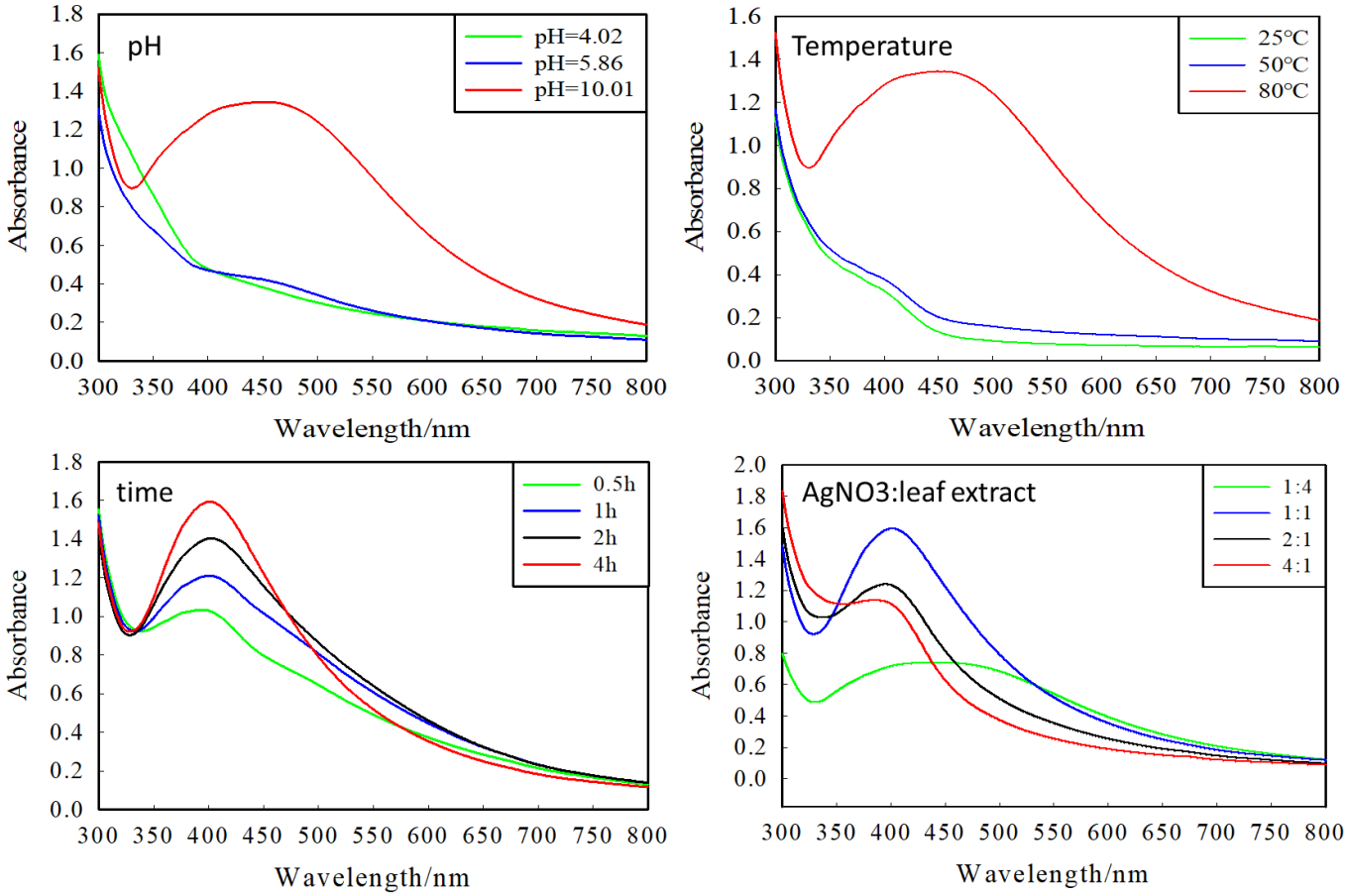

Figure S3. Optimized reaction conditions including pH, temperature, reaction time and the ratio of $AgNO_3$ and leaf extract.

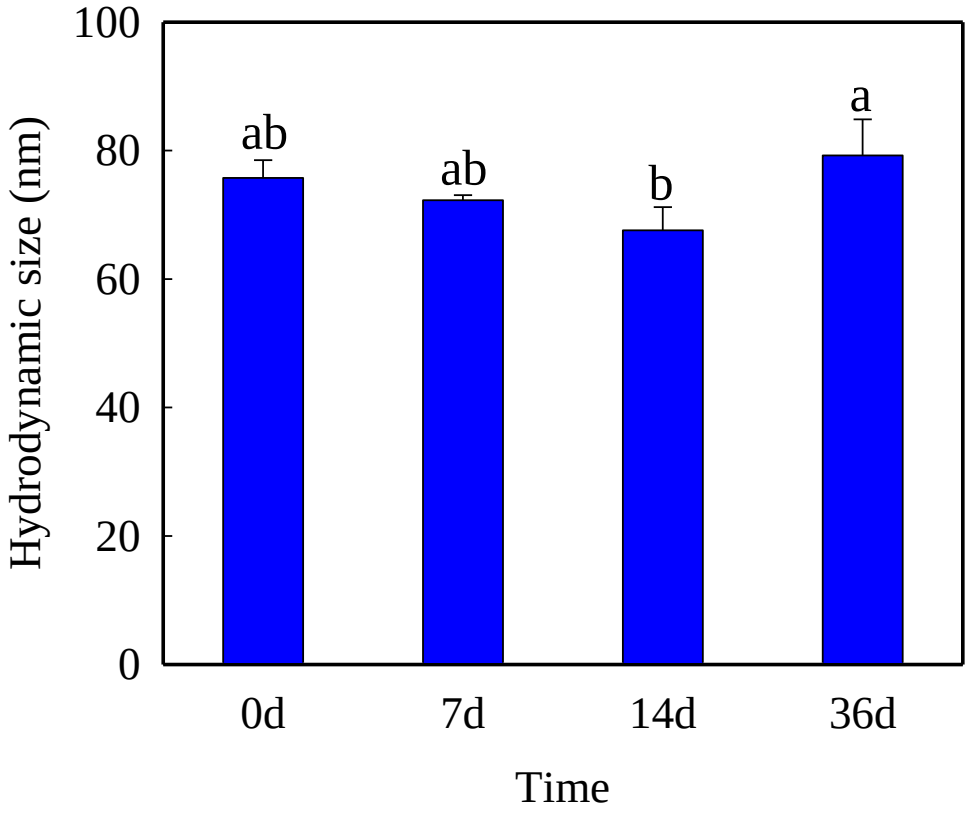

Figure S4. Stability (hydrodynamic size changes) of the obtained AgNP. The hydrodynamic size of AgNP was determined at day 0, 7, 14 and 36. AgNPs was fabricated by adding 1.25 mL $AgNO_3$ NPs to 1.25 mL cucumber leaf extracts at pH 10, react for 4 h at 80 °C.

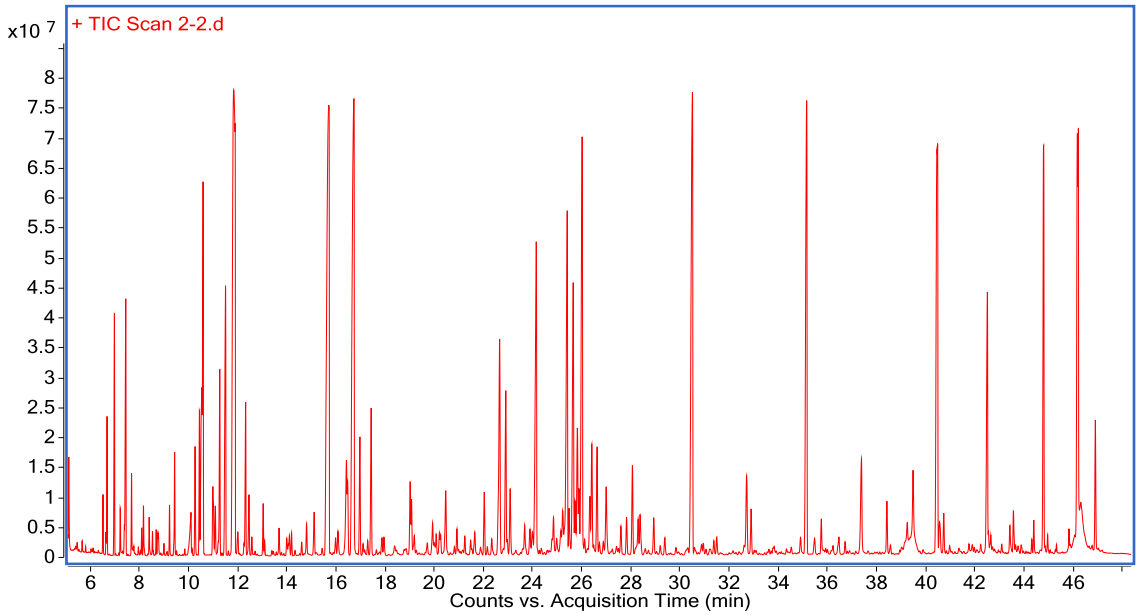

Figure S5. A representative chromatogram (TIC) from GC-MS